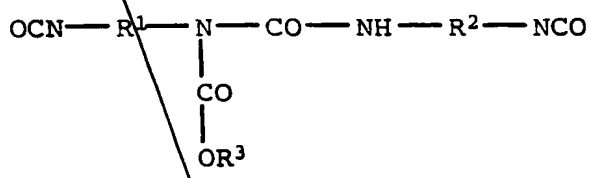
THE FOLLOWING IS THE ENGLISH TRANSLATION OF THE ANNEXES TO THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT : AMENDED SHEETS (Pages 14, 15, 16, and 17).

We claim:

1. A diisocyanate of the formula (I)



(I)

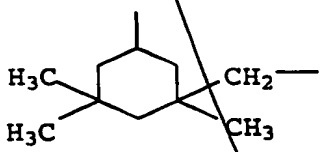
in which the radicals have the following meanings:

R^1, R^2: both radicals a radical of the formula (II)

(II)

(diisocyanates Ia)

one radical a radical of the formula (II) and the other radical a radical of the formula (III)



(III)

(diisocyanates Ib)

both radicals a radical of the formula (III) (diisocyanates Ic),

R^3: - a 5- or 6-membered cycloalkyl radical in which up to 3 hydrogen atoms may be substituted by C_1-C_4-alkyl radicals and one or two methylene units may be substituted by an oxygen atom and/or a tertiary nitrogen atom which additionally carries a C_1-C_4-alkyl radical, or

- a C_1-C_4-alkyl radical in which one hydrogen atom is substituted by a 5- or 6-membered cycloalkyl radical in which up to 3 hydrogen atoms may be substituted by C_1-C_4-alkyl radicals and one or two methylene units may be substituted by an oxygen atom and/or a tertiary nitrogen atom which additionally carries a C_1-C_4-alkyl radical; a pyrrolidone radical or a morpholine radical, where in the case of the two last-mentioned radicals the nitrogen atom is attached to the alkyl radical.

2. A diisocyanate as claimed in claim 1, in which the radical R^3 is derived from an alcohol selected from the group consisting of cyclohexanol, cyclohexanemethanol, cyclopentanol, cyclopentanemethanol, 3,3,5-trimethylcyclohexanol, menthol, norborneol, N-methyl-4-hydroxypiperidine, 4-(2-hydroxyethyl)-morpholine and 4-(2-hydroxyethyl)pyrrolidone.

3. A mixture comprising

- diisocyanates (Ia), (Ib) and/or (Ic),
- urethanes of the formula (IV)

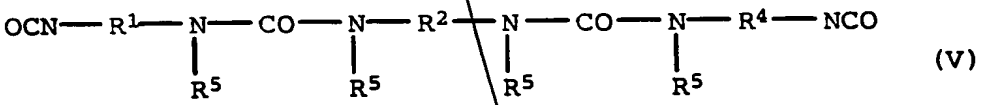
$$OCN\text{-}R^1\text{-}NH\text{-}CO\text{-}OR^3 \qquad (IV)$$

in which the radicals R^1 and R^3 may have the following meanings:

R^1: a radical of the formula (II) or (III)

R^3: the meaning indicated in claim 1;

- diisocyanates of the formula (V)



(V)

in which the radicals R^1, R^2, R^4 and R^5 may have the following meanings:

R^1, R^2, R^4: the meaning indicated for R^1 in formula (I),

R^5: 2 of the total of 4 radicals are hydrogen and the other two radicals are a radical of the formula (VI)

$$-CO\text{-}O\text{-}R^3 \qquad (VI)$$

with the radicals R^5 having the same meaning being separated by the unit R^2; and

- isocyanurates composed of 3 molecules selected from the group consisting of isophorone diisocyanate and hexamethylene diisocyanate (monoisocyanurates VII).

4. A mixture as claimed in claim 3, where the weight ratio of diisocyanates (I) to monoisocyanurates (VII) is from 10:1 to 1:10.

5. A mixture as claimed in claim 3 or 4, where the proportion of isophorone diisocyanate or hexamethylene diisocyanate is less than 0.5% by weight.

6. A mixture as claimed in any of claims 3 to 5, where the sum of the proportions of the diisocyanates (Ia), (Ib), (Ic), (V), the urethane (IV) and the isocyanurate (VII) is from 10 to 100% by weight.

7. A process for preparing a mixture as claimed in any of claims 3 to 6, which comprises reacting

(i) isophorone diisocyanate, hexamethylene diisocyanate or a mixture of these isocyanates in the presence of a catalyst with a

- 5- or 6-membered cycloaliphatic alcohol in which up to 3 hydrogen atoms attached to one carbon atom may be substituted by C_1-C_4-alkyl radicals and one or two methylene units may be substituted by an oxygen atom and/or a tertiary nitrogen atom which additionally carries a C_1-C_4-alkyl radical, or

- C_1-C_4-alkyl alcohol in which one hydrogen atom attached to a carbon atom is substituted by a 5- or 6-membered cycloalkyl radical in which up to 3 hydrogen atoms may be substituted by C_1-C_4-alkyl radicals and one or two methylene units may be substituted by an oxygen atom and/or a tertiary nitrogen atom which additionally carries a C_1-C_4-alkyl radical; a pyrrolidone radical or morpholine radical, where in the case of the two last-mentioned radicals the nitrogen atom is attached to the alkyl radical of the alcohol;

the molar ratio of said isocyanates to said monoalcohol being from 1.5:1 to 20:1,

(ii) deactivating the catalyst and

(iii) removing any unreacted isocyanate.

8. A process as claimed in claim 7, wherein the reaction is continued until the resulting reaction product after removing any unreacted isophorone diisocyanate or hexamethylene diisocyanate still present has a viscosity of from 100 to 10,000 mPas measured in accordance with ISO 3219, Annex B.

9. A two-component coating composition comprising a compound which carries polyisocyanate-reactive groups (component A) and a compound of the formula (I) (component B).

10. A method of coating articles which comprises

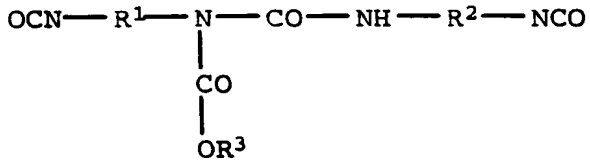
- preparing a coating composition as claimed in claim 9 by mixing components (A) and (B) and
- applying the coating composition in sheetlike manner to an article within 12 h of the preparation of said composition.

11. A coated article produced as claimed in claim 10.

Diisocyanates with allophanate groups derived from alicyclic alcohols

Abstract

Diisocyanates of the formula (I)



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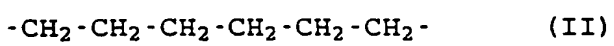

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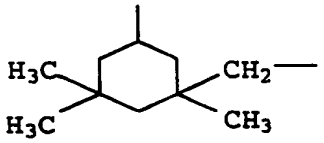

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- a C_1-C_4-alkyl radical in which one hydrogen atom is substituted by a 5- or 6-membered cycloalkyl radical in which up to 3 hydrogen atoms may be substituted by C_1-C_4-alkyl radicals and one or two methylene units may be substituted by an oxygen atom and/or a tertiary nitrogen atom which additionally carries a C_1-C_4-alkyl radical; a pyrrolidone radical or a morpholine radical, where in the case of the two last-mentioned radicals the nitrogen atom is attached to the alkyl radical.